

**TRANSLATION**

**PATENT COOPERATION TREATY**

**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

|   |   |   |                       |
|---|---|---|-----------------------|
| Applicant's or agent's file reference<br><b>5139/00/FB</b>  | <b>FOR FURTHER ACTION</b>                                       |   | See Form PCT/IPEA/416 |
| International application No.<br><b>PCT/FR2004/003209</b>   | International filing date (day/month/year)<br><b>10.12.2004</b> | Priority date (day/month/year)<br><b>23.12.2003</b> |                       |
| International Patent Classification (IPC) or national classification and IPC<br><b>B01 D53/62, B01 D53/14, B01 D53/34, B01 D53/75, B01 D53/78, B01 D53/84</b> |   |   |                       |
| Applicant<br><b>INSTITUT FRANCAIS DU PETROLE</b>  |   |   |                       |

|   |
|---|
| <p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <b>4</b> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> <p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p> |
|---|

|   |                                   |
|---|-----------------------------------|
| Date of submission of the demand        | Date of completion of this report |
| Name and mailing address of the IPEA/EP | Authorized officer                |
| Facsimile No.                           | Telephone No.                     |

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/FR2004/003209

## Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
 

This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
 
  - international search (Rule 12.3 and 23.1(b))
  - publication of the international application (Rule 12.4)
  - international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the **elements** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):
 

the international application as originally filed/furnished  
 the description:  
 pages 1-8 \_\_\_\_\_ as originally filed/furnished  
 pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
 pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
 the claims:  
 nos. 1-24 \_\_\_\_\_ as originally filed/furnished  
 nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19  
 nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
 nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
 the drawings:  
 sheets \_\_\_\_\_ as originally filed/furnished  
 sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
 sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
 a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3.  The amendments have resulted in the cancellation of:
 

the description, pages \_\_\_\_\_  
 the claims, nos. \_\_\_\_\_  
 the drawings, sheets/figs \_\_\_\_\_  
 the sequence listing (*specify*): \_\_\_\_\_  
 any table(s) related to sequence listing (*specify*): \_\_\_\_\_
4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
 

the description, pages \_\_\_\_\_  
 the claims, nos. \_\_\_\_\_  
 the drawings, sheets/figs \_\_\_\_\_  
 the sequence listing (*specify*): \_\_\_\_\_  
 any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/FR2004/003209Box No. V **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

## 1. Statement

|                               |        |      |     |
|-------------------------------|--------|------|-----|
| Novelty (N)                   | Claims | 1-24 | YES |
|                               | Claims |      | NO  |
| Inventive step (IS)           | Claims | 1-24 | YES |
|                               | Claims |      | NO  |
| Industrial applicability (IA) | Claims | 1-24 | YES |
|                               | Claims |      | NO  |

## 2. Citations and explanations (Rule 70.7)

Reference is made to the following document:

D1: US-A-3 720 591 (SKARLOS L) 13 March 1973  
(1973-03-13).

1. The present application fulfils the requirements set forth in PCT Article 33(1) because the subject matter of claims 1 to 24 is novel (PCT Article 33(2)) and involves an inventive step as defined in PCT Article 33(3).

Document D1, which is considered to be the prior art closest to the subject matter of the first claim, describes a method for producing oxalic acid by means of carbon dioxide sequestration (cf. claims 1 to 5 and 10), which method includes a liquid-phase CO<sub>2</sub> concentration step (a), followed by an electro-reduction step (b) in which the liquid phase is electro-reduced in an aprotic medium to a compound in which the carbon has an oxidation degree of +3 in the oxalic acid form thereof.

Box No. V      **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

The subject matter of the first claim differs from this known method in that it includes a mineralisation step (c) in which the compound produced in the electro-reduction step is reacted with a compound of an element M, whereby a mineral in which the carbon:M ratio is approximately 2:1 is produced.

It follows that the subject matter of the first claim is novel (PCT Article 33(2)).

In step (c), the reaction of the oxalic compound with a compound M produces (in accordance with the reaction described on page 5, line 19, of the description) one mole of CO<sub>2</sub> per C<sub>2</sub>O<sub>4</sub>. It follows that the amount of CO<sub>2</sub> released is half the starting amount. Moreover, since element M is usually calcium or magnesium, the final mineralisation step (c) can be performed by contacting the oxalic acid solution with a sedimentary rock, for example, a limestone or a magnesium-bearing rock, preferably via injection into the subsoil.

It follows that the present application is considered to involve an inventive step (PCT Article 33(3)).

Claims 2 to 24 are dependent on the first claim and, as such, therefore also fulfil the PCT requirements of novelty and inventive step.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FR2004/003209

|           |   |
|-----------|---|
| Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
|-----------|---|